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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/840,886

04/25/2001

Jason Peter Andrew Charlesworth

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08/18/2004

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EXAMINER

VO, HUYEN X

ART UNIT

PAPER NUMBER

2655

11
DATE MAILED: 08/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/840,886

Applicant(s)

CHARLESWORTH ET AL.

Examiner

Huyen Vo

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2001.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-58 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 25 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5-10 if ✓
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 4/15/2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 58 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, computer program. Since computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process without a computer-readable medium needed to realize the computer program's functionality. Therefore, the computer executable program for controlling a processor to perform a method is a nonstatutory functional descriptive material.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 15, 17-18, 23, 25, 27-30, 43, 45-46, 51, 53, 55, and 56, are rejected under 35 U.S.C. 102(e) as being anticipated by Baker (US Patent No. 6122613).

3. Regarding claims 1, 29, and 57, Baker et al. disclose an apparatus and method for determining a sequence of sub-word units representative of at least two words output by a word recognition unit in response to a common input word to be recognized, the apparatus comprising:

means for receiving a first sequence of sub-word units representative of a first one of said at least two words and for receiving a second sequence of sub-word units representative of a second one of said at least two words (*507 and 509 of figure 5*);

means for aligning and for comparing sub-word units of the first sequence with sub-word units of the second sequence to form a number of aligned pairs of sub-word units (*col. 10, ln. 11-67*); and

means for determining a sequence of sub-word units representative of the received words in dependence upon the aligned pairs of sub-word units determined by said aligning and comparing means (*col. 10, ln. 11-67*).

4. Regarding claims 25 and 53, Baker discloses an apparatus for determining a sequence of sub-word units representative of at least two words, the apparatus comprising:

means for receiving a first sequence of sub-word units representative of a first word and for receiving a second sequence of sub-word units representative of a second word (*referring to figure 5, combiner receives 2 inputs from two recognizers*);

means for aligning sub-word units of the first sequence with sub-word units of the second sequence to form a number of aligned pairs of sub-word units (*col. 10, ln. 11-67*); and

means for determining a sequence of sub-word units representative of the first and second sequences of sub-word units by determining, for each aligned pair of sub-word units, a sub-word unit that is confusingly similar to the first and second sub-word units of the aligned pair (*col. 8, ln. 19-55 and col. 10, ln 11-67*).

5. Regarding claims 27 and 55, Baker further discloses an apparatus for determining a sequence of sub-word units representative of at least two words output by a word recognition unit in response to a common input word to be recognized, the apparatus comprising:

means for receiving the words output by the word recognition unit (*referring figure 5*); means for generating a sequence of sub-word units representative of each of the received words (*col. 8, ln. 19-29, a phoneme is a sub-word unit*);

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means for aligning and comparing the sub-word units from each generated sequence of sub-word units to identify a number aligned groups of sub-word units (*the recognizers in figures 5 select an N-best candidates words that are confusingly similar and send them to the combiner*); and

means for determining a sequence of sub-word units representative of the first and second sequences of sub-word units by determining, for each of the sub-word units in an aligned group, a sub-word unit that it confusingly similar to the sub-word units of the group (*col. 10, ln. 11-67*).

6. Regarding claims 28 and 56, Baker discloses an apparatus for determining a sequence of sub-word units representative of at least two words output by a word recognition unit in response to a common input word to be recognised, the apparatus comprising:

means for receiving a first sequence of sub-word units representative of a first one of said at least two words and for receiving a second sequence of sub-word units representative of a second one of said at least two words (*input to the combiner 511 in figure 5*);

means for aligning and for comparing sub-word units of the first sequence with sub-word units of the second sequence to form a number of aligned pairs of sub-word units (*col. 8, ln. 19-55 and col. 10, ln. 11-67*);

first comparing means for comparing, for each aligned pair, the first sequence sub-word unit in the aligned pair with each of a plurality of sub-word units taken from a

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set of predetermined sub-word units, to provide a corresponding plurality of comparison scores representative of the similarities between the first sequence sub-word unit and the respective sub-word units of the set (*Offline Recognizer 503 in figure 5, the operation of a speech recognizer is well known to a person of ordinary skill in the art*);

second comparing means for comparing, for each aligned pair, the second sequence sub-word unit in the aligned pair with each of said plurality of sub-word units from the set, to provide a further corresponding plurality of comparison scores representative of the similarities between said second sequence sub-word unit and the respective sub-word units of the set (*Real-Time Recognizer 505 in figure 5, the operation of a speech recognizer is well known to a person of ordinary skill in the art*);

means for combining the comparison scores obtained when comparing the first and second sequence sub-word units in the aligned pair with the same sub-word unit from the set, to generate a plurality of combined comparison scores (*col. 8, ln. 19-55 and col. 10, ln. 11-67*);

third comparing means for comparing, for each aligned pair, the combined comparison scores generated by said combining means for the aligned pair (*col. 10, ln. 11-67*); and

means for determining, for each aligned pair of sub-word units, a sub-word unit representative of the sub-word units in the aligned pair in dependence upon a comparison result output by said third comparing means for the aligned pair (*col. 10, ln. 11-67*).

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7. Regarding claims 2 and 30, Baker et al. further disclose that the determining means is operable to determine said sequence of sub-word units by determining, for each aligned pair of sub-word units, a sub-word unit that it confusingly similar to the first and second sub-word units of the aligned pair (*col. 10, ln. 11-67, the word "had" and "hat" are confusingly similar*).

8. Regarding claims 15, 18, 23, 43, 46, and 51, Baker further discloses that each of said sub-word units represents a phoneme (*col. 8, ln. 19-28*), a word to sub-word unit dictionary which is operable to receive the words output by said word recognition unit and to generate therefrom said sequences of sub-word units (*referring figure 5, it is inherent that any speech recognizer must compare the input speech word against a plurality of predetermined templates stored in the system*), and the word recognition unit comprises a speech recognition system (*figure 5*).

9. Regarding claims 17 and 45, Baker further discloses that the receiving means is operable to receive a third sequence of sub-word units representative of a third one of said words output by said recognition unit (*col. 7, ln. 17-26, by including a third recognizer in the system, the combiner would receive a third set of n-best candidates*) and wherein said aligning and comparing means is operable to align and compare two sequences of sub-word units at a time (*col. 10, ln. 11-67*).

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10. Claims 26 and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Tran (US Patent No. 6070140).

11. Regarding claims 26 and 54, Tran discloses an apparatus for determining a sequence of sub-word units representative of at least two words output by a word recognition unit in response to a common input word to be recognized, the apparatus comprising:

means for receiving the words output by the word recognition unit (*col. 19, ln. 40-67*); means for generating a sequence of sub-word units representative of each of the received words (*col. 18, ln. 40-67, a phoneme is a sub-word unit*);

means for aligning and comparing the sub-word units from each generated sequence of sub-word units to identify a number aligned groups of sub-word units (*col. 18, ln. 40 to col. 19, ln. 35*); and means for determining a sequence of sub-word units representative of the received words in dependence upon the aligned groups of sub-word units determined by said aligning and comparing means (*col. 19, ln. 1-35*).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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13. Claims 3-14 and 31-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker (US Patent No. 6122613) in view of Tran (US Patent No. 6070140).

14. Regarding claims 3 and 31, Baker further disclose the determining means comprises:

first comparing means for comparing, for each aligned pair, the first sequence sub-word unit in the aligned pair with each of a plurality of sub-word units taken from a set of predetermined sub-word units, to provide a corresponding plurality of comparison scores representative of the similarities between the first sequence sub-word unit and the respective sub-word units of the set (*Offline Recognizer 503 in figure 5, any speech recognizer must compare the input speech with speech models stored in memory to determine a match*);

second comparing means for comparing, for each aligned pair, the second sequence sub-word unit in the aligned pair with each of said plurality of sub-word units from the set, to provide a further corresponding plurality of comparison scores representative of the similarities between said second sequence sub-word unit and the respective sub-word units of the set (*Real-Time Recognizer 505 in figure 5, any speech recognizer must compare the input speech with speech models stored in memory to determine a match*);

means for combining the comparison scores obtained when comparing the first and second sequence sub-word units in the aligned pair with the same sub-word unit from the set, to generate a plurality of combined comparison scores (*col. 10, ln. 11-67*);

third comparing means for comparing, for each aligned pair, the combined comparison scores generated by said combining means for the aligned pair (*col. 10, ln. 11-67*); and means for determining, for each aligned pair of sub-word units, a sub-word unit representative of the sub-word units in the aligned pair in dependence upon a comparison result output by said third comparing means for the aligned pair (*col. 10, ln. 11-67*).

Baker fails to specifically disclose that the first and second comparing means includes an aligning step. However, Tran teaches an alignment step that can be used in the first and second comparing means (*col. 19, ln. 1 to col. 20, ln 45*).

Since Baker and Tran are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Baker by incorporating the teaching of Tran in order to improve speech recognition accuracy by enabling the system to determine matches more precisely.

15. Regarding claims 4-7 and 32-35, Baker further disclose that the first and second comparing means are operable to compare the first sequence sub-word unit and the second sequence sub-word unit respectively with each of the sub-word units in said set of sub-word units (*recognizers 503 and 505 in figure 5 must compare the input speech*

word against speech word models stored in the memory to generate a set of candidates words), the first and second comparing means are operable to provide comparison scores which are indicative of a probability of confusing the corresponding sub-word unit taken from the set of predetermined sub-word units as the sub-word unit in the aligned pair (*referring to figure 5*), the combining means is operable to combine the comparison scores in order to multiply the probabilities of confusing the corresponding sub-word unit taken from the set as the sub-word units in the aligned pair (*referring to figure 5 or col. 8, ln. 29-56*), and each of said sub-word units in said set of predetermined sub-word units has a predetermined probability of occurring within a sequence of sub-word units (*col. 8, ln. 19-28*) and wherein said combining means is operable to weigh each of said combined comparison scores in dependence upon the respective probability of occurrence for the sub-word unit of the set used to generate the combined comparison score (*col. 10, ln. 11-67*).

16. Regarding claims 8 and 36, Baker further discloses an apparatus according to claim 7, wherein said combining means is operable to combine said comparison scores by calculating:

$$P(d.sub.i.sup.1.vertline.p.sub.r)P(d.sub.j.sup.2.vertline.p.sub.r)P(p.sub.r)$$

where $d.sub.i.sup.1$ and $d.sub.j.sup.2$ are an aligned pair of first and second sequence sub-word units respectively; $P(d.sub.i.vertline.p.sub.r)$ is the comparison score output by said first comparing means and is representative of the probability of confusing set sub-word unit $p.sub.r$ as first sequence sub-word unit $d.sub.i$;

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($d_{sup.2.sub.j.vertline.p-sub.r}$) is the comparison score output by said second comparing means and is representative of the probability of confusing set sub-word unit $p_{sub.r}$ as second sequence sub-word unit $d_{sup.2.sub.j}$; and $P(p_{sub.r})$ is a weight which represents the probability of set sub-word unit $p_{sub.r}$ occurring in a sequence of sub-word units (*col. 8, ln. 29-67, the equation in line 50 is the same as the equation claimed. If the equation in line 50 is expanded, three terms are obtained, (expressed in summation). The addition of three terms are the same as the multiplication of three terms claimed because the addition of negative logarithmic values can also be expressed as product of three scalar probability values*).

17. Regarding claims 9 and 37, Baker further discloses that third comparing means is operable to identify the set sub-word unit $p_{sub.r}$ which gives the maximum combined comparison score and wherein said determining means is operable to determine said sub-word unit representative of the sub-word units in the aligned pair as being the sub-word unit which provides the maximum combined comparison score (*col. 8, ln. 19-56 and col. 10, ln. 11-67*).

18. Regarding claims 10-12 and 38-40, Baker et al. further disclose that the comparison scores represent log probabilities and wherein said combining means is operable to multiply said probabilities by adding the respective comparison scores (*col. 10, ln. 11-67, referring to equation*), each of the sub-word units in said first and second sequences of sub-word units belong to said set of predetermined sub-word units and

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wherein said first and second comparing means are operable to provide said comparison scores using predetermined data which relate the sub-word units in said set to each other (*referring to elements 503-507 in figure 5*), and the predetermined data comprises, for each sub-word unit in the set of sub-word units, a probability for confusing that sub-word unit with each of the other sub-word units in the set of sub-word units (*col. 11, ln. 1-53 or referring to figure 13, uncertainty probability of the confusing word is corrected*).

19. Regarding claims 13 and 41, Baker does not disclose that the aligning and comparing means comprises dynamic programming means for aligning said first and second sequences of sub-word units using a dynamic programming technique. However, Tran teaches that the aligning and comparing means comprises dynamic programming means for aligning said first and second sequences of sub-word units using a dynamic programming technique (*col. 19, ln. 1 to col. 20, ln. 31-48*).

Since Baker and Tran are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Baker by incorporating the teaching of Tran in order to align speech words for better analysis to enhance speech recognition accuracy.

20. Regarding claims 14 and 42, the modified Baker, as applied in claim 13, does not disclose that the dynamic programming means is operable to determine an optimum alignment between said first and second sequences of sub-word units. However, Tran

further teaches that the dynamic programming means is operable to determine an optimum alignment between said first and second sequences of sub-word units (*col. 20, In 1-48*).

Since the modified Baker and Tran are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Baker by incorporating the teaching of Tran in order to select the most probable candidates for further processing.

21. Claims 3 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker (US Patent No. 6122613).

22. Regarding claims 16 and 44, Baker further discloses, "*the speech recognition system ... could employ three or more recognizers*" (*col. 7, In. 17-26*). Baker fails to specifically disclose that the receiving means is operable to receive a third sequence of sub-word unit representative of a third one of the words output by said word recognition unit and wherein said aligning and comparing means is operable to simultaneously align and compare the sub-word units of the first, second and third sequences of sub-word units.

However, it would have been obvious to one of ordinary skill in the art at the time of invention that by employing a third speech recognizer in the system disclosed in figure 5, as taught by Baker, the combiner would receive a third set of n-best candidates and their associate scores, and the combiner combines the scores of three candidates

together as it does in the case of two speech recognizers in (*col. 10, ln. 11-67*). The advantage of including a third recognizer in the system of figure 5, as taught by Baker, is to optimize other recognition properties.

23. Claims 19-22 and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker (US Patent No. 6122613) in view of Oliver (US Patent No. 6289140).

24. Regarding claims 19 and 47, Baker does not disclose a means for annotating a data file using the sub-word units outputted by said determining means. However, Oliver teaches a means for annotating a data file using the sub-word units outputted by said determining means (*col. 5, ln. 1-61*).

Since Baker and Oliver are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Baker by incorporating the teaching of Oliver in order to provide conveniences for users to annotate document files by using input speech.

25. Regarding claims 20-22 and 48-50, Baker does not disclose that the annotating means is operable to annotate said data file using said sub-word units and said words output by said word recognition unit, the sequence of sub-word units and said words are combined to form annotation data for the data file. However, Oliver further teaches that the annotating means is operable to annotate said data file using said sub-word units

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and said words output by said word recognition unit (*col. 5, ln. 44 to col. 6, ln. 51*), and the sequence of sub-word units and said words are combined to form annotation data for the data file (*col. 5, ln. 44 to col. 6, ln. 51*).

Since Baker and Oliver are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Baker by incorporating the teaching of Oliver in order to provide conveniences for users to annotate document files by using input speech.

26. Claims 24 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker (US Patent No. 6122613) in view of Applebaum et al. (US Patent No. 6463413).

27. Regarding claims 24 and 52, Baker does not disclose that word recognition unit comprises a handwriting recognition system. However, Applebaum et al. teach that word recognition unit comprises a handwriting recognition system (*col. 2, ln. 22-33*).

Since Baker and Applebaum et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Baker by incorporating the teaching of Applebaum et al. in order to provide various modes of input to satisfy user's taste and preferences.

Conclusion

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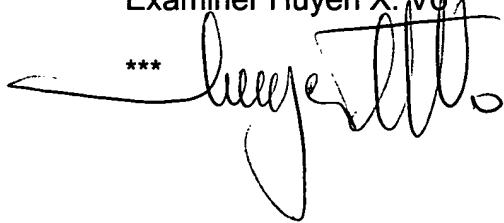
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665.

The examiner can normally be reached on M-F, 9-5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Huyen X. Vo



July 20, 2004



W. R. YOUNG
PRIMARY EXAMINER